HIGH SPEED ACTIVE OPTICAL SYSTEM FOR PHASE-SHIFTING PORTIONS OF AN INCOMING OPTICAL WAVEFRONT

ABSTRACT

The present application is directed to high speed optical system. In one embodiment, the optical system includes a photodiode which is sensitive to a wavelength of light, an image source irradiating a wavefront of a first wavelength on the photodiode to which the photodiode is sensitive, the wavefront containing an optical path difference induced phase-shift, a read source of photons irradiating photons of a second wavelength to which the photodiode is insensitive, an electric field across the photodiode in excess of the breakdown voltage thereof and configured to result in an avalanching of electrons in the photodiode when the photons from the first source strike the photodiode, the avalanching electrons resulting in a photorefractive response which changes the index of refraction in the photodiode, and a capture device in optical communication with and configured to capture light reflected from the photodiode.